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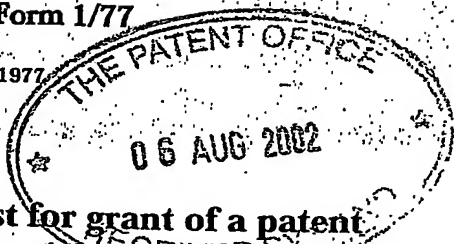


Signed

Dated

15 August 2003

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07AUG02 E339085-2 D00574
P01/7700 0.00-0218270.7

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Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road
Newport
South Wales
NP10 8QQ

1. Your reference

JN/P9171GB

2. Patent application number

(The Patent Office will fill in this part)

0218270.7

3. Full name, address and postcode of the or of each applicant (underline all surnames)

Matthew J. SEARLE

74 High Street

Bruton

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BA10 0AJ

Patents ADP number (if you know it)

If the applicant is a corporate body, give the country/state of its incorporation

6513600002

4. Title of the invention

IMPROVEMENTS IN OR RELATING TO THE
HEATING OF PRODUCTS

5. Name of your agent (if you have one)

W. H. Beck, Greener & Co.

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

W. H. Beck, Greener & Co.

7 Stone Buildings

Lincoln's Inn

London WC2A 3SZ

Patents ADP number (if you know it)

323001

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number

Country

Priority application number
(if you know it)

Date of filing
(day / month / year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application

Date of filing
(day / month / year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

No

a) any applicant named in part 3 is not an inventor, or

b) there is an inventor who is not named as an applicant, or

c) any named applicant is a corporate body.

See note (d))

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 5

Claim(s)

Abstract

Drawing(s) 1

10. If you are also filing any of the following, state how many against each item.

Priority documents

Translations of priority documents

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*)

Request for preliminary examination and search (*Patents Form 9/77*)

Request for substantive examination (*Patents Form 10/77*)

Any other documents
(please specify)

11.

I/We request the grant of a patent on the basis of this application.

Signature

W. Beck Green

Date 06.08.02

12. Name and daytime telephone number of person to contact in the United Kingdom

Mrs. Jacqueline Needle - (020) 7405 0921

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Notes

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IMPROVEMENTS IN OR RELATING TO THE
HEATING OF PRODUCTS

5 The present invention relates to a method of heating a product and to
apparatus for heating a product. Preferably, the apparatus and method of the
invention relate to the heating of food products.

WO 96/29255 shows an example of a self-heating or self-cooling can.
The self-heating can has a heating insert contained within a re-entrant base of
10 the container and when quicklime and water contained within that insert are
mixed the contents of the can are heated by the resulting exothermic reaction.
However, the self-heating can utilises conduction and convection methods to
transfer the heat of the reaction to the contents of the can, and for some
products this can be too slow.

15

PCT/GB02/01864 describes apparatus in which foods and other
substances contained in bowls, trays and other containers are heated by the
injection of steam into the container. The steam is thereby given free access
to all parts of the contained substances and quick heating results.

20

However, neither of these methods of heating are applicable, for
example, to the heating of snacks such as sandwiches, wraps, pasties and
pies. If such snacks were to be heated by an apparatus as described in
PCT/GB02/01864, for example, their outer layers or casings would become too
25 hot to hold, but the inside would stay cold.

It is an object of this invention to provide an alternative heating method
which is applicable, for example, to snack foods.

30

According to a first aspect of the present invention there is provided a
method of heating a product, where the product comprises a constituent
contained within an outer wrapper, the method comprising the step of injecting
a hot vapour into the constituent within the outer wrapper to heat the product.

35

Although this invention does have applicability to the heating of products
other than food products, it is particularly advantageous where the product to

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be heated is a food product which comprises foodstuff contained within an outer wrapper.

5 In an embodiment, the outer wrapper may be of packaging material. For example, a sandwich or pie might be contained within a close fitting sandwich box, wrapped in foil or a plastics material, or enclosed within a plastics bag.

10 Alternatively, the outer wrapper may be edible and part of the food product itself, such as a pie crust, the pastry container of a pastie, or a wrap.

It will be apparent that a method of an embodiment of the invention provides for direct heating of the constituent of the product by the injection of a hot vapour therein, but that the outer wrapper, however it is configured, provides an insulating layer which will act to protect a user handling the product. The outer wrapper also provides the container within which the heating takes place.

20 Where the product is a food product, the hot vapour injected into the food product will generally be steam.

The present invention also extends to apparatus for heating a product, where the product comprises a constituent contained within an outer wrapper, the apparatus comprising a support for the product, a hot vapour generator, and a nozzle insertable within a product provided on said support.

25 In a preferred embodiment, the support is provided by at least part of the hot vapour generator.

30 The hot vapour generator and/or the nozzle may be arranged and/or configured in any of the manners described and/or defined in our copending application No. UK 0205304.9.

Preferably, the product to be heated is a food product and the hot vapour generator is a steam generator.

Embodiments of the present invention will hereinafter be described, by way of example, with reference to the accompanying drawing in which there is shown a cross section through a food product in situ in apparatus for heating the food product.

5 This invention is concerned with the heating of products which have a constituent within an outer wrapper. Generally, the product will be a food product having a foodstuff contained within an outer wrapper which may or may not be edible. However, non-foodstuff products may also be heated by a
10 method of this invention. Such non-foodstuff products may include, for example, a towel received within a plastics bag, or leg wax housed within a plastics pouch.

Thus, the present invention is not limited to the specific nature of the
15 product and any product which can be heated by a hot gas without spoiling or adversely reacting can be heated by a method of the invention.

In preferred embodiments, the invention is concerned with heating the product using steam which has been locally and contemporaneously
20 generated. However, where contents other than foodstuffs are to be heated, it may be preferred to use heated gases and vapours obtained from sources other than water. Clearly, for local generation, sources which vaporise readily and attain acceptable temperatures will be preferred.

25 Our copending UK patent application No. 0205304.9 describes a method of heating the contents of a container utilising the local generation of vapour and the structures of hot vapour generators described therein may be used or adapted for use with the present invention.

30 The figure shows a particular embodiment of a heating apparatus which is presently preferred and which is specifically designed for heating a snack food product. The food product illustrated is a sandwich 10 comprising a filling 5 of appropriate foodstuffs provided between layers of bread 6.

35 As is shown in the figure, the heating apparatus comprises a support 1 for the food product 10. The support 1 is hollow and defines a chamber for

receiving a first reactant material, for example, such as quicklime. The chamber within the support 1 is arranged to be put into communication with an upstanding chamber 2 in which a second reactant material, such as water, is provided. Initially, the chambers 1 and 2 are separated from each other but when they are put in communication by way of appropriate activating means, indicated at 7, steam will be generated within a headspace 3 within the chamber 2 as described, for example, in the earlier specification No. 205304.9.

An elongate nozzle 4 which, for example, may be configured as any of the injection nozzles described in UK application No. 0205304.9, communicates with the headspace 3. When the food product 10 is placed onto the support 1 it is arranged such that the nozzle 4 extends within the foodstuff 5. It will therefore be appreciated that any steam within the headspace 3 will be injected into the food product but between the layers 6. The layers 6 therefore act to form a steam container whereby efficient heating of the foodstuff 5 is achieved. In due course, there may be some heating of the outer layers 6 but in general, these layers will act as insulators to enable the heated product 10 to be safely handled.

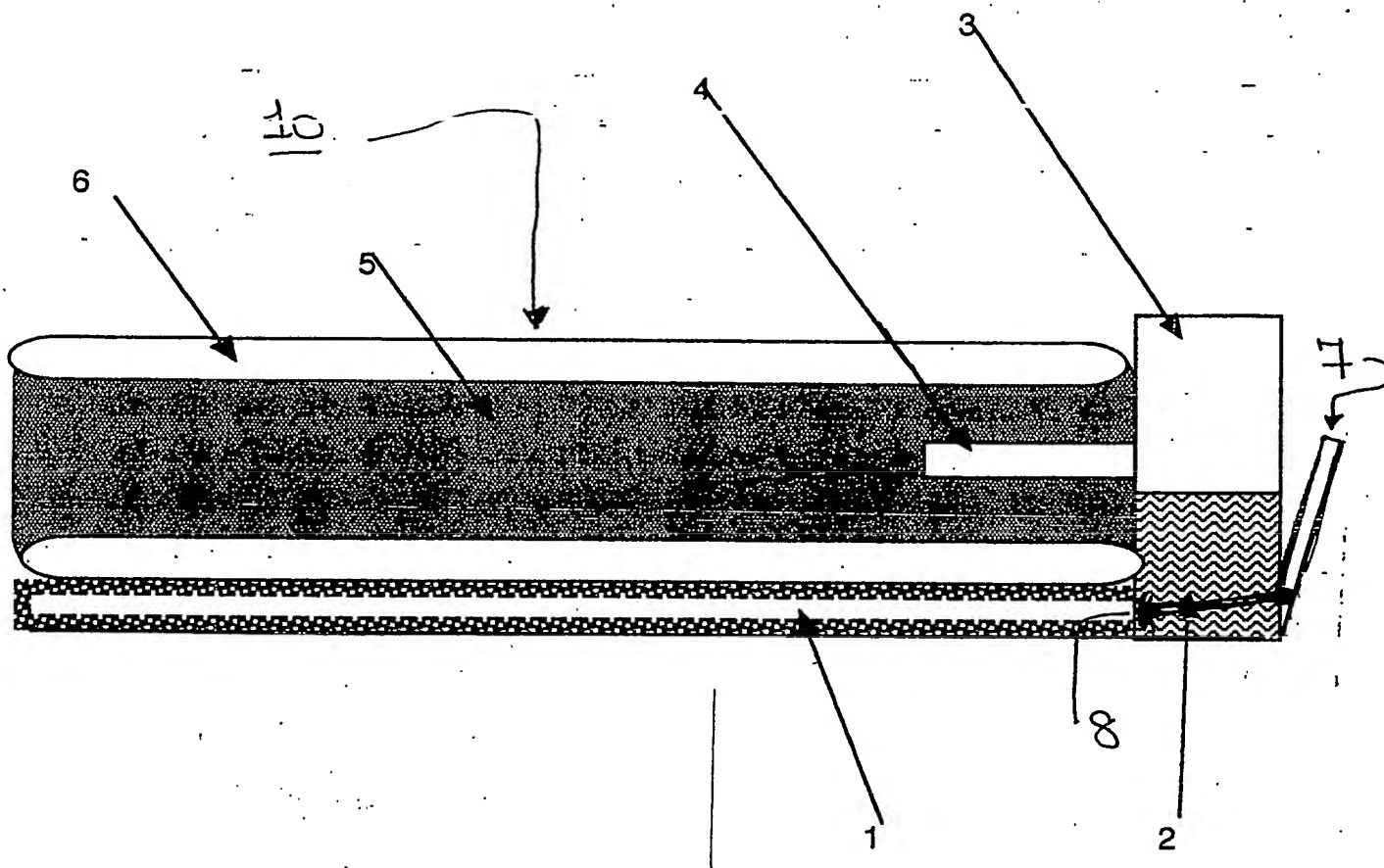
The structure of the chambers 1 and 2, and the nature of their separation can be chosen as required to suit the circumstances. Generally, a breakable or rupturable membrane, as indicated at 8, will be provided. However, a removable mechanical closure may alternatively be provided. Clearly, the nature of the activating means 7 will be chosen to be appropriate to the nature of the separation means.

The food product 10 illustrated is not enclosed by the layers 6 which form the outer wrapper. This enables the steam to be vented readily. In general, the steam will condense in the foodstuff, but if required steam guards may be provided to prevent a user of the apparatus from coming into contact with the steam.

Where the product to be heated is entirely enclosed by its wrapper, for example, is a pie within a crust, any steam not condensed in the foodstuff will generally diffuse through the crust. Where the outer wrapper is impervious, for

example, the product is a towel within a plastics bag, or a sandwich within a sandwich box, appropriate vents should be provided.

5 It will be appreciated that modifications and alterations to the embodiment as described and illustrated may be made within the scope of the present invention.



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